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## THE ORTHOPTERAN GROUP SCUDDERLÆ.

By SAMUEL H. SCUDDER.

Presented June 9, 1897.\*

THE Scudderiæ are Phaneropterine Locustarians in which the fastigium of the vertex is slightly deflexed, acuminate or subacuminate, no broader than the first antennal joint, the pronotum plane above and in no way sellate, the fore coxæ armed with a spine, the fore tibiæ sulcate above with acute margins and the genicular lobes of the hind femora blunt, armed only with a feeble spine or spines.

There are but three genera in this strictly American † group, the one here added easily distinguished from the others by the unusual breadth of the front of the fastigium of the vertex, and represented by a single species found in California. One of the other genera also has but a single species in North America, but unlike the others is represented elsewhere. Only the North American forms are considered in this paper. The third genus, from which the group takes its name, is more abundant in species, two of which are described here for the first time, while the somewhat tangled synonymy indicates in what confusion the names have been employed. . These three genera may be distinguished by the following table:—

### *Table of the genera of Scudderiæ.*

*a*<sup>1</sup>. Fastigium of vertex between the antennæ less than half the width of the basal antennal joint; mesosternum not more than half as broad again as long; tegmina and wings of unequal length, both surpassing the hind femora; tegmina four or more than four times as long as broad, the tympanum of male twice as long as broad, with nearly straight sides and crossed by a single stout vein; genicular lobes of hind femora armed at apex with a single distinct but not very long spine.

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\* Subsequently rewritten.

† One species is credited to Africa, but it may be doubted whether it strictly belongs here.

$\delta^1$ . Fore and middle femora unarmed beneath, the hind femora either unarmed or with few and inconspicuous spines beneath; subgenital plate of male long, slender, apically V-shaped in cross section and with few exceptions apically compressed . . . . . *Scudderia*.

$\delta^2$ . All the femora distinctly spinulose beneath; subgenital plate of male short and broad, apically with a broad rounded emargination.

*Symmetropleura*.

$\alpha^2$ . Fastigium of vertex between the antennæ nearly as broad as the basal antennal joint; mesosternum about twice as broad as long; tegmina and wings of equal length, not surpassing the hind femora; tegmina hardly more than three times as long as broad, the tympanum of male but little longer than broad with very arcuate sides and crossed by a pair of stout veins; genicular lobes of hind femora armed apically with a pair of minute spines . . . . . *Platylyra*.

#### SCUDDERIA Stål.

*Scudderia* Stål, Öfv. k. Vet.-Akad. Förh., XXX., 41 (1873); Rec. Orth., II., 14 (1874).

This genus, which combines a very narrow fastigium between the eyes with fore and middle femora unarmed beneath, has for its most striking feature the peculiar armature of the male abdomen, which, however, is greatly modified in two of the species; it consists in the highly developed structure of the anal segment, which is greatly produced, bearing a pistillate, more or less decurved process, and this bears beneath at base a compressed, depending, securiform lamina, and at tip is forked or notched to receive and partially embrace the apical portion of the long, tapering, upcurved, subgenital plate.

The genus is confined to North America, where it is widely distributed from the central portions of Central America to Canada, but appears to be quite absent from the Antilles. In Brunner's first monograph of the Phaneropterinae, certain South American forms were placed with the North American, but in his supplement to that work he has separated them. One species, however, occurs in Panama. The number of species is not great, less than a dozen being known, but they have been frequently confused and are sometimes difficult to separate, especially the females.

As regards the structure of the anal segment of the male, the species of *Scudderia* show four main types, according to which they may be grouped. In one, the expanded apical portion is shaped somewhat (in one species remarkably) like an ox-hoof, the lobes tumid and apically

rounded, and the cleft between them distinct, deep, and parallel, or almost parallel; in another the lobes become laterally expanded flattened flanges, separated by a moderately deep rectangular or subrectangular emargination; in the third, the lateral flanges are vertical, being compressed instead of depressed, and are widely separated by a moderately deep but abrupt and wide apical emargination, the base of which is broadly transverse and has a minute median projection; in this group the process completely embraces laterally the upturned subgenital plate, although the latter is exceptionally broad, and not, as in the other types, more or less strongly compressed apically; finally, in a fourth group, the segment is not produced at all, and the species which fall under it are very diverse in the structure of the subgenital plate, which is otherwise very similar throughout the genus.

These distinctions have been used as the basis of the separation of the males of this genus in the following table:—

*Table of the species of Scudderia, based upon the male.*

*a*<sup>1</sup>. Anal segment expanded apically into a pistillate process; subgenital plate strongly compressed apically, though more or less depressed basally; cerci relatively short and more or less strongly incurved.

*b*<sup>1</sup>. Anal segment apically truncate with a minute median projection and compressed, completely vertical, lateral flanges, which project beyond the main body posteriorly, and so completely embrace and generally extend beyond the sides of the subgenital plate when in natural position . . . . . 1. *texensis*.

*b*<sup>2</sup>. Produced claviform or pistillate apical portion of anal segment, as seen from above, generally considerably expanded and always deeply and narrowly or distinctly and angularly emarginate at apex, with no median projection, the lateral lobes touching only and not fully embracing the sides of the subgenital plate when in place, and never surpassing it.

*c*<sup>1</sup>. Anal segment subrectangularly emarginate at apex, the lateral lobes depressed, laterally expanded, laminate.

*d*<sup>1</sup>. Tegmina much broader than depth of body and relatively short, at most not much over four times longer than middle breadth, the principal vein distinctly flexuous; apical flanges of anal segment subtriangular, distinctly tapering . . . 2. *pistillata*.

*d*<sup>2</sup>. Tegmina no broader than depth of body and relatively long, nearly or more than five times longer than middle breadth, the principal vein nearly straight; apical flanges of anal segment well rounded, subequal in breadth.

*e*<sup>1</sup>. Tegmina relatively broad, in the middle (and especially in the female) distinctly broader than the length of the pronotum; lateral lobes of pronotum nearly vertical, subacutely separated from the disk by lateral canthi; depending, compressed, securiform basal plate of anal segment of medium size . . . . . 3. *curvicauda*.

*e*<sup>2</sup>. Tegmina relatively narrow, in the middle distinctly narrower than the length of the pronotum; lateral lobes of pronotum flaring below, very obtusely separated from the disk, there being no sign of lateral canthi; depending, compressed, securiform basal plate of anal segment of exceptional size.

4. *laticauda*.

*c*<sup>2</sup>. Anal segment very deeply and narrowly emarginate at apex, the sides of the emargination or fissure parallel or nearly so, the lateral lobes variously developed but generally incrassate, separated by a space too narrow properly to admit the subgenital plate.

*d*<sup>1</sup>. Each lateral half of the expanded apical portion of anal segment about twice or more than twice as long as broad, subcylindrical, the deep apical emargination narrow with parallel sides.

*e*<sup>1</sup>. The apical expanded portion of anal segment conspicuously emarginate in the middle, as seen laterally, the apical lateral flanges more or less obliquely compressed and laminate; hind femora with a few spines beneath on inner margin only.

5. *mexicana*.

*e*<sup>2</sup>. The apical lateral lobes of the anal segment forming subcylindrical, subcompressed, and rounded masses, not laterally emarginate; hind femora spined beneath on both margins.

*f*<sup>1</sup>. Lateral canthi of pronotum subdistinct, at least posteriorly; subgenital plate conspicuously surpassing the tip of the anal segment, the latter with no lamina depending between the cerci at its base . . . . . 6. *ungulata*.

*f*<sup>2</sup>. Lateral canthi of pronotum entirely wanting; anal segment just reaching the apex of the subgenital plate, and with a conspicuous, backward-directed median lamina depending from its base between the cerci, forming a calcariform process . . . . . 7. *paronæ*.

*d*<sup>2</sup>. Apical portion of anal segment forming a cleft unguliform body, very deeply emarginate apically, each lateral half consisting of a swollen mass not greatly longer than broad, the apical emar-

gination somewhat less deep than in the alternate category, but generally with parallel or subparallel sides.

*e*<sup>1</sup>. Enlarged apical portion of anal segment broadest, when viewed from above, at the middle of the apical emargination, unicolorous, less pronounced, the arms of the fork less tapering, as much compressed as depressed, with no prominent basal heel, and hardly triangular as seen laterally . . . 8. *furcifera*.

*e*<sup>2</sup>. Enlarged apical portion of anal segment broadest, when viewed from above, at the base of the apical emargination, more or less infuscated, more pronounced, the arms of the fork more tapering, more depressed than compressed, often conspicuously swollen at base and with a prominent basal heel, and more or less triangular as seen laterally . . . 9. *furcata*.

*a*<sup>2</sup>. Anal segment triangular or transversely quadrate with no apical process; subgenital plate depressed throughout; cerci relatively long and gently arcuate.

*b*<sup>1</sup>. Anal segment triangular, apically angulate; subgenital plate apically incised to a depth less than the middle breadth of the plate, the lobes divaricate; cerci tapering, apically acuminate; hind femora spined beneath on inner margin only or not at all.

10. *septentrionalis*.

*b*<sup>2</sup>. Anal segment transversely quadrate, apically truncate; subgenital plate apically incised to half its length, forcipiform, the lobes oppositely arcuate; cerci hardly tapering, apically bifid or biangulate; hind femora spined beneath on both margins . . . 11. *forcipata*.

The females of the species of *Scudderia* are relatively difficult to separate, as Saussure has already remarked. The following table for their determination has therefore been constructed with much difficulty, and will sometimes fail to prove entirely satisfactory.

*Table of the species of Scudderia, based upon the female.*

(The females of *S. paronæ* Griff., and *S. forcipata* Brunn., are not known.)

*a*<sup>1</sup>. Ovipositor bent as well as curved, generally (excl. *laticauda*) distinctly less than half as long again as pronotum.

*b*<sup>1</sup>. Disk of pronotum distinctly broadening from in front backward; few or no spinules on the inner carina of underside of hind femora.

*c*<sup>1</sup>. Disk of pronotum distinctly less than half as long again as its posterior breadth, distinctly dilating posteriorly; tegmina less than four times as long as broad . . . 2. *pistillata*.

$c^2$ . Disk of pronotum half as long again as its posterior breadth, less dilated posteriorly; tegmina nearly or quite five times as long as broad.

$d^1$ . More compressed forms, with relatively longer legs, slenderer pronotum with deeper lateral lobes, and with the serrations of the margins of the ovipositor more prominent . . . 1. *texensis*.

$d^2$ . More robust forms, with relatively shorter legs, stouter pronotum, with shallower lateral lobes, and with the serration of the margins of the ovipositor less prominent . . . 3. *curvicauda*.

$b^2$ . Disk of pronotum with parallel or nearly parallel sides.

$c^1$ . Pronotum with very rounded shoulders between lateral lobes and disk; 5-6 spinules on inner carina of under surface of hind femora . . . . . 4. *laticauda*.

$c^2$ . Pronotum sharply shouldered where the lateral lobes join the disk; few or no spinules on the inner carina of under surface of hind femora.

$d^1$ . Larger and more elongate forms, with slenderer pronotum; tegmina about five and a half times as long as broad; wings in repose extending beyond tegmina by distinctly more than the length of the pronotum; hind femora nearly as long as tegmina.

5. *mexicana*.

$d^2$ . Smaller and less elongate forms with stouter pronotum; tegmina about five times as long as broad; wings in repose extending beyond tegmina by not more than the length of the pronotum; hind femora very much shorter than tegmina.

$e^1$ . Basal plica of ovipositor not marked with black.

8. *furcifera*.

$e^2$ . Basal plica of ovipositor generally marked with black.

9. *furcata*.

$a^2$ . Ovipositor curved but hardly bent, more than half as long again as pronotum.

$b^1$ . Tegmina much more than 30 mm. long, about five times as long as broad and nearly six times as long as pronotum; hind femora with several spines on each margin beneath; ovipositor narrower in middle than toward base, tapering through at least the apical third; lateral lobes of pronotum as deep as broad . . . . . 6. *ungulata*.

$b^2$ . Tegmina much less than 30 mm. long, less than four times as long as broad and five times as long as pronotum; lateral lobes of pronotum distinctly broader than deep; hind femora with a single spine or two on each margin beneath . . . . . 10. *septentrionalis*.

1. *Scudderia texensis*. Fig. 1.

*Scudderia texensis* Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 330, pl. 15, figs. 18, 19 (1897).

*Scudderia curvicauda* Blatchl. ! [nec De Geer], Proc. Ind. Acad. Sc., 1892, 99-100 (1894).

“ “ Beut. !, Bull. Amer. Mus. Nat. Hist., VI., 275, pl. 7, figs. 5, 6 (1894).

Some specimens from S. Carolina, Georgia, and Florida have a distinctly more compressed form, without luteous canthi, and with slenderer and longer lateral flanges on the pistillate portion of the anal segment of the male; but I have found so much variation and gradation in all these points that it seems hardly proper to regard them as even a variety.

Norway, Oxford Co., Me., Smith (M. C. Z.). Mass. (S. H. S.); Newtonville and Sherborn (Morse), and Malden (Sprague), Middlesex Co.; Vicinity of Boston (Morse); Canton, Walpole, and Wollaston (Sprague), Norfolk Co.; and West Chop, Dukes Co. (Morse), Mass. Thompson, Windham Co., Montville, New London Co., North Haven, New Haven Co., South Kent and Canaan, Litchfield Co., and Stamford, Fairfield Co. (Morse), Conn. New York (S. H. S.); Long Island, N. Y. (S. H. S.). Maryland, Uhler (S. H. S.). Michigan, Miles (S. H. S.). Chillicothe, Ross Co., Denton (Morse), Ohio. Vigo and Putnam Co., Blatchley (S. H. S.), Ind. Illinois, Uhler (S. H. S.), Stromberg (M. C. Z.); Chicago (S. H. S.); and Watertown, Rock Isl. Co., McNeill (S. H. S.), Ill. Jefferson, Green Co., Allen (S. H. S.), and Dallas Co., Allen (S. H. S.), Iowa. West Point, Cuming Co., and Lincoln, Lancaster Co. (Bruner), Nebr. Ogden, Utah, Edwards (Beutenmüller). Georgia, Oemler and Morrison (S. H. S.). South Carolina (S. H. S.). Florida, Uhler (S. H. S.), and Morrison (M. C. Z.); Sandford, Orange Co., Frazer (S. H. S.), and Jacksonville, Duval Co., Ashmead and Priddey (Bruner), Florida. Texas, and Dallas, Texas, Belfrage, Boll, Agassiz (M. C. Z., S. H. S.).

2. *Scudderia pistillata*. Fig. 2.

*Scudderia pistillata* Brunn., Mon. Phaneropt., 240-241 (1878).

“ “ Beut., Bull. Amer. Mus. Nat. Hist., VI., 276-277 (1894).

“ “ Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 332 (1897).



*Scudderia curvicauda* Scudd. ! (pars) [nec De Geer] Bost. Journ. Nat. Hist., VII., 448 (1862).

*Scudderia furculata* Blatchl. ! [nec Brunn.], Proc. Ind. Acad. Sc., 1892, 100-101 (1894).

Halifax, Nova Scotia, Piers (S. H. S.). Winnipeg, Manitoba, Kennicott (S. H. S.), Scudder (M. C. Z.). Moosehead Lake (S. H. S.); Mt. Desert Is. (S. H. S.); and Norway, Smith (M. C. Z., Morse), and Bethel, Edmands (M. C. Z.), Oxford Co., Me. New Hampshire (t. Brunner); White Mts., valleys and subalpine (S. H. S.); and Franconia, Slosson (S. H. S.) and Bethlehem, Agassiz (M. C. Z.), Grafton Co., N. H. Mass. (S. H. S.); Adams, Berkshire Co. (Morse); Newton, Middlesex Co., Henshaw (M. C. Z.); Wollaston and Walpole, Norfolk Co. (Sprague); and Provincetown, Barnstable Co. (Morse), Mass. Chateaugay Lake, Adirondacks, Bowditch (S. H. S.) and Ithaca, Tompkins Co. (Morse), N. Y. New Jersey (t. Smith). Michigan, Miles (S. H. S.). Marshall, Fulton, Vigo and Putnam Co., Ind. (Blatchley). Southern Illinois, Thomas (S. H. S.). Iowa (t. Osborn, Ball). Nebraska, Dodge (S. H. S.), and West Point, Cuming Co. Bruner, (S. H. S.), Nebr. Bismarck, Burleigh Co., N. Dak. (Bruner). Georgia (t. Saussure-Pictet).

This is a northern species, and the last reference above is surprising, the most southerly stations otherwise known being Southern Illinois and Central Indiana.

### 3. *Scudderia curvicauda*. Fig. 3.

*Locusta curvicauda* De Geer !, Mém., III., 446, pl. 38, fig. 3 (1773).

*Gryllus (Tettigonia) curvicaudus* Goeze, Ent. Beytr., II., 98 (1778).

*Phaneroptera angustifolia* Harr. !, Ins. Inj. Veg., 129 (1841).

*Phaneroptera curvicauda* Scudd. ! (pars \*), Bost. Journ. Nat. Hist., VII., 448 (1862).

*Scudderia curvicauda* Stål, Öfv. k. Vet.-Akad. Förh., XXX., 41 (1873).

“ “ Brunn., Mon. Phaneropt., 240 (1878).

“ “ Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 331-332, pl. 15, fig. 20 (1897).

*Scudderia furculata* Beut. ! [nec Brunn.], Bull. Amer. Mus. Nat. Hist., VI., 275 (1894).

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\* Specimens in my collection and in that of the Museum of Comparative Zoology used by me in 1862, as well as my own words at the time, show that I did not then distinguish between this species and *S. pistillata*; and, as specimens then sent to Brunner further show, neither did I distinguish *S. septentrionalis*. I have accordingly quoted this reference under each of these species.

I follow Stål and Brunner in the determination of this as De Geer's species, aided by a specimen still in my possession, which I compared with the type more than thirty years ago and identified as the same.

After an examination of Harris' types of his *Phan. angustifolia* in 1862, I agreed with Uhler (Harr., Ins. Inj. Veg., 3 ed. 161, note) that it was the same as *curvicauda* De Geer; but at that time, as stated in my note above, I recognized but a single species in New England, so that in the present study of the species I have not been very confident of my former determination. At present there remains only a damaged tegmen of one specimen and the pronotum of another, but by their aid and by careful and repeated comparisons of New England specimens of all the species occurring there I still find that *angustifolia* must be regarded as a synonym of *curvicauda*. The tegmen is much too large for New England specimens of either *furcata* or *septentrionalis*, too slender for *pistillata*, and agrees better, as does the broader pronotum, with *curvicauda* than with *texensis*, which last, moreover, is a much rarer species in New England. Brunner was led into regarding *septentrionalis* as Harris' *angustifolia* from my sending him specimens of *septentrionalis* marked as *curvicauda*, and by the absence in Harris' description of any reference to a pistillate anal segment, while mentioning the subgenital plate; but the specimens preserved, such as they are, entirely preclude this, and Harris' running description was so general and so little technical that the absence of mention of the peculiar anal segment is not surprising.

Fryeburg, Oxford Co., Me. (Morse). Hampton (S. H. S.) and Kingston, Denton (Morse), Rockingham Co., N. H. Brandon, Rutland Co., (S. H. S.), and Brattleboro', Windham Co. (Morse), Vt. South Hadley, Hampshire Co. (Morse); Gloucester, Essex Co. (Sprague); Malden (Sprague), Sherborn (Morse), and Woburn, Shute (M. C. Z.), Middlesex Co.; Wellesley, Blue Hills, and Dover (Morse), Canton, Walpole, Milton, and Wollaston (Sprague), Norfolk Co.; Scituate, Plymouth Co. (Sprague); Provincetown (Morse, S. H. S.); Hyannis (S. H. S.), and Woods Holl (Morse), Barnstable Co.; and West Chop, Dukes Co. (Morse), Mass. Wickford, Washington Co., and Block Island, Newport Co., R. I. (Morse). Thompson, Windham Co., Canaan, Litchfield Co., New Haven and North Haven, New Haven Co., and Stamford, Fairfield Co., Conn. (Morse). Long Island (S. H. S.) and Ithaca, Tompkins Co. (t. Beutenmüller), N. Y. Pennsylvania (t. De Geer). Maryland, Uhler (S. H. S.). Chillicothe, Ross Co., Ohio, Denton (Morse). Putnam, Vigo and Lake Co., Ind., Blatchley (S. H. S., Morse). Michigan, Miles (S. H. S.). Jefferson, Greene Co., and Dallas Co., Allen (S. H. S.),

Iowa. Kentucky, Sanborn (M. C. Z.). North Carolina, Morrison (M. C. Z., S. H. S.). Georgia, Morrison (M. C. Z., S. H. S.). Jacksonville, Duval Co., Ashmead (Bruner), and Sanford, Orange Co., Frazer (S. H. S.), Fla. Monticello, Lawrence Co., Miss., Jamison (S. H. S.). Texas, Boll, Agassiz, Schaupp (M. C. Z.); Texas, Boll, Belfrage, "common in October in woods on plants and bushes" (S. H. S.); Gulf coast of Texas, Aaron (S. H. S.); New Braunfels, Comal Co., Lincecum (S. H. S.), Texas. Orizaba, Vera Cruz, and Tabasco, Mex. (t. Saussure and Pictet).

#### 4. *Scudderia laticauda*. Fig. 4.

*Scudderia laticauda* Brunn., Mon. Phaneropt., 238-239 (1878).

" " Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 330, pl. 15, fig. 15 (1897).

This species appears in two forms; one is wholly green, the other (which may be called *strigata*) is heavily infuscated in stripes along the hind margin of the tegmina, and anterior margin of the anal area. It is found at Jacksonville, Duval Co., Fla., Priddey (Bruner). The species is credited to Georgia by Brunner, and to Georgia and Texas by Saussure and Pictet.

#### 5. *Scudderia mexicana*. Fig. 5.

*Phaneroptera mexicana* Sauss., Rev. Mag. Zool., 1861, 129 (1861).

*Scudderia furculata* Brunn., Mon. Phaneropt., 239, pl. 5, fig. 72 b (1878).

" " Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 331, pl. 15, fig. 21 (1897).

There seems to be no reason why the name of *mexicana* should not be restored to this species.

Grant's Pass, Josephine Co., Oregon (Morse, S. H. S.). Los Angeles (Bruner) and Coronado, San Diego Co. (Morse), Cal. Texas (t. Brunner). Mexico, Botteri (S. H. S.); Matamoras, Tamaulipas, Couch (S. H. S.); Corona da California, Blaisdell (Bruner); Guerrero, Vera Cruz, and Tabasco (t. Saussure and Pictet); and Orizaba (Bruner), Mexico. Guatemala, Van Patten (S. H. S.).

#### 6. *Scudderia unguolata*, sp. nov. Fig. 6.

Testaceo-flavescent,\* the legs and veins of the tegmina feebly rufescent, the face luteous. Eyes rather large and prominent. Fastigium of

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\* The specimens have perhaps been immersed for a short time in spirits and so lost their greenish color.

the vertex much compressed, contiguous with the frontal fastigium. Antennæ very long and slender, rufescent in the basal half, very narrowly interrupted with fuscous at the distal extremity of each joint. Pronotum with the disk scarcely enlarging posteriorly, plane or feebly convex, the front margin straight, the hind margin gently and uniformly convex, the lateral lobes vertical or subvertical, the lateral canthi fairly well marked but rounded except posteriorly, the lobes margined throughout, of equal length and breadth, very strongly convex and subangulate below, well rounded behind. Tegmina about five times as long as broad, semiopaque, glistening, the front margin basally arcuate, the apex subangulate and obliquely truncate below, the anal area exceptionally long and tapering, the principal vein a little flexuous, the radial branch forked in the middle of its course, the whole considerably surpassing the hind femora; wings longer than tegmina. Fore femora armed beneath on the front margin with 2-3 spines, the middle femora with 1-2, the hind femora with 4-5 small black spines on the inner, 3-5 on the outer margin; fore tibiæ with 2-4 spines on the outer margin above, 3-4 spines on each margin below; middle tibiæ spined above and below on each margin. Anal segment of male tumid at base, rapidly narrowing to form beyond the middle constriction a pistillate process consisting of a pair of subcylindrical rolls placed side by side, each rather shallower than broad, fully twice as long as broad, when seen laterally nowhere broader than the middle portion of the segment, straight and slightly tapering, the tip blunt; seen from above, they are together slightly broader than the middle portion of the segment, being a little tumid, cleft by a basally rounded deep emargination with subparallel sides to the middle of the pistillate portion, the whole bent downward at an obtuse angle with the base of the segment, the apical emargination not wide enough to receive any portion of the subgenital plate, the whole resembling a tuning fork with rounded arms. The subgenital plate of male considerably surpasses the anal segment, is rather strongly bent-arcuate, depressed, and tapers throughout though very little in the distal half, the extreme apex compressed and angularly excised so as to be V-shaped. Cerci of male very strongly incurved and twisted, rather stout and not very long, regularly tapering. Ovipositor half as long again as the pronotum, very regularly arcuate, tapering with considerable uniformity, bluntly pointed, the margins feebly crenulate, the whole rufo-castaneous, greenish toward base, the basal plica unmarked.

Length of body, ♂, 21 mm.; ♀, 23 mm. Pronotum, ♂, ♀, 6 mm. Tegmina, ♂, 38 mm.; ♀, 34 mm. Breadth of same, ♂, 7.75 mm.; ♀,

7? mm. Length of fore femora, ♂, 6.5 mm.: ♀, 6.25 mm. Hind femora, ♂, 28 mm.; ♀, 28.5 mm. Subgenital plate, 6 mm. Ovipositor, 9.5 mm.

1 ♂, 1 ♀, Tepic, Mexico, Prof. L. Bruner.

I do not feel entirely confident of the distinctness of this species from *S. paronæ* Griff., from Panama, which I know only by description. The greatest apparent difference is in the total absence in the single male at hand of any sign of the characteristic median compressed lamina, depending between the cerci from the base of the anal segment; but as the presence of this lamina has been determined in every other species of *Scudderia* I have seen which has a pistillate anal segment, I do not feel sure that it is not present and crowded forward beyond and hidden by the anal cerci, which in this specimen completely hide from view anything there may be in such a place; dissection only could determine this point. The minor points of difference from *S. paronæ* (judging by the descriptions of the latter, which are unusually full) are the somewhat larger size and considerably longer members, the presence of lateral canthi on the pronotum, the considerably greater proportionate length of the tegmina to the hind femora, which they much surpass, the flexuosity of the principal vein, the forking of the radial branch at and not before the middle, the spiniferous lower margin of the fore femora, the greater number of spines on the lower margins of the hind femora and their wholly black color, the fewer spines of the fore tibiæ and the greater length of the subgenital plate relative to the anal segment.

#### 7. *Scudderia paronæ*.

*Scudderia paronæ* Griff., Boll. Mus. Zool. Univ. Tor., XI., No. 232, 11-13 (1896).

“ “ Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 330 (1897).

I have not seen this species, but it must be closely allied to the last. Only the male is known and is reported from Colon, Panama, by Griffini and in the *Biologia*.

#### 8. *Scudderia furcifera*, sp. nov. Fig. 7.

Green, often more or less testaceo-flavescent, the lateral canthi of pronotum usually narrowly luteous, the face lutescent. Eyes moderately large and prominent. Fastigium of the vertex apically strongly compressed, superiorly emarginate, in close contact with the frontal fastigium. Antennæ luteo-rufescent, uniform except for a lack of rufescence next

base. Pronotum with nearly parallel sides, being almost as broad posteriorly as anteriorly, the disk plane, the front margin nearly straight, the hind margin moderately convex, the lateral canthi distinct, the lateral lobes being vertical or subvertical and rectangularly inserted in the disk, slightly deeper than broad, the front margin vertical excepting below, the lower margin and hind margin each strongly convex and subangulate, the whole feebly margined. Tegmina about five times as long as broad, somewhat opaque, the anal area moderately long, the principal vein scarcely flexuous, the radial branch forked near the middle of its course, the whole only a little surpassing the hind femora; wings extending considerably beyond tegmina. Fore femora armed beneath on the front margin with 2-3 spines, the middle femora, which are much longer, unarmed, the hind femora with 1-4 spines on inner, 0-3 spines on outer margin; fore tibiæ with 1-2 spines on outer margin above, 3-4 on either margin below; middle tibiæ spined on the posterior margin only above, on both margins below. Anal segment of male rapidly and uniformly tapering to slightly beyond the middle and then expanding into a somewhat decurved thickened apical portion, consisting of two lateral oval everywhere rounded lobes, scarcely tapering, apically bluntly rounded, and separated by an equal or diverging interspace half as broad as the middle portion of the segment and formed by a deep apical emargination; the whole is pale testaceous or castaneous, nearly or quite uniform, and is broadest, when viewed from above, at the middle of the emargination. Cerci of male subcylindrical, incurved and mesially bent, not very long, moderately stout, and apically pointed. Subgenital plate of male extending but very little if at all beyond the tip of the anal segment, bent-arcuate, tapering and depressed in the basal half, subequal in the apical half, compressed and emarginate at tip, forming an arcuate V in cross section. Ovipositor somewhat longer than the pronotum, not very broad, bent-arcuate beyond the base, the tip rounded subacuminate, the margins densely crenulato-dentate, the whole castaneous, the basal plica luteous.

Length of body, ♂, 17 mm.; ♀, 21 mm. Pronotum, ♂, 5.2 mm.; ♀, 5.1 mm. Tegmina, ♂, 29.5 mm.; ♀, 28 mm. Middle breadth of same, ♂, 6.5 mm.; ♀, 6 mm. Length hind femora, ♂, 23 mm.; ♀, 24.5 mm. Ovipositor, 6.5 mm.

11 ♂, 2 ♀. Medellin, Vera Cruz, Mexico, Heyde; Tepic, Jalisco, Mex.; both received from Prof. L. Bruner. Venis Mecas, Mex., Palmer (S. H. S.); Mexico, Botteri (S. H. S.). Since description I have received a male from Prescott, Arizona, collected by H. Edwards (Beutenmüller).

9. *Scudderia furcata*. Fig. 8.

- Scudderia furcata* Brunn., Mon. Phaneropt., 239, pl. 5, fig. 72 a (1878).  
 “ “ Blatchl.!, Proc. Ind. Acad. Sc., 1892, 101-102 (1894).  
 “ “ Beut.!, Bull. Amer. Mus. Nat. Hist., VI., 275 (1894).  
 “ “ Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 331,  
 pl. 15, figs. 16, 17 (1897).  
 ? *Gryllus* (*Locusta*) *myrtifolius* Drury [nec Linn.], Ill. Nat. Hist., II.,  
 78, pl. 41, fig. 2 (1773).  
*Locusta myrtifolia* Fabr., Syst. Ent., 282 (1775).  
*Phaneroptera curvicauda* Burm.! [nec De Geer], Handb. Ent., II.,  
 690 (1838).  
*Scudderia angustifolia* Blatchl.! [nec Harr.], Proc. Ind. Acad. Sc.,  
 1892, 102-103 (1894).  
 “ “ Beut.!, Bull. Amer. Mus. Nat. Hist., VI., 276  
 (1894).  
*Scudderia fasciata* Beut.!, Loc. cit., VI., 276 (1894).

Stål, on study of Linné's type, finds his *Gryllus myrtifolius* (1758) to be a *Ctenophlebia*. Fabricius described his *Locusta myrtifolia* as the same, and Brunner accordingly quotes him in his synonymy of *Cten. myrtifolia*; but Fabricius' description (“anus maris lamina clavata, furcata”) hardly allows this, and is very descriptive of the present species, to which it is also probable, but not so certain, that Drury's earlier figure from New York belongs.

I saw Burmeister's type of his *Phan. curvicauda* in the Berlin Museum more than thirty years ago, and made a drawing with notes of its characteristic anal segment; his description also applies well to this species only.

This is the most widely spread of any of the species of *Scudderia*, and appears to be tolerably common everywhere. The form *fasciata*, described as a distinct species by Beutenmüller, is one in which the principal longitudinal veins of the tegmina are marked heavily with fuscous, a feature repeated in several species of the genus.

Montreal, Canada, Lyman (S. H. S.). Maine (t. Brunner); Norway, Oxford Co. (M. C. Z., Morse); and Deering (Morse) and Brunswick, Packard (M. C. Z., S. H. S.), Cumberland Co., Me. White Mts., Valleys (S. H. S., Sprague), N. H. Brandon, Rutland Co., Vt., uplands (S. H. S.). Adams, Berkshire Co. (Morse); Princeton, Worcester Co. (S. H. S.); Beverly, Burgess (S. H. S.), and Gloucester (Sprague), Essex Co.; Sherborn (Morse), Cambridge (M. C. Z.), and

Malden (M. C. Z., Sprague), Middlesex Co.; Vicinity of Boston (M. C. Z., S. H. S.); Dover and Blue Hills (Morse), Wollaston and Dedham (Sprague) and Milton (M. C. Z., Sprague), Norfolk Co.; Seekonk, Bridgham (M. C. Z.), Bristol Co.; Scituate (Sprague), Plymouth Co.; Provincetown, Barnstable Co. (Morse); and Nantucket (S. H. S.), Mass. Kingston, Washington Co., R. I. (Morse). Connecticut, Norton (S. H. S.); Thompson, Windham Co.; New Haven; and Stamford, Fairfield Co. (Morse), Conn. Mt. Vernon, Westchester Co., Fitch (M. C. Z.) and Ithaca, Tompkins Co. (Morse), N. Y. New Jersey (t. Smith). Maryland, Uhler (S. H. S., M. C. Z.). Chillicothe, Ross Co., Ohio, Denton (Morse). Indiana (t. Blatchley). Northern Illinois, Kennicott (S. H. S.); Rock Island, McNeill (S. H. S.), and Port Byron, Rock Island Co., McNeill (S. H. S.); and Ogle Co., Allen (S. H. S.), Ill. Kentucky, Sanborn (M. C. Z.); Lexington, Fayette Co., Garman (S. H. S.), Ky. Virginia (Bruner). Carolina (t. Burmeister). North Carolina, Morrison (S. H. S.). Georgia, Morrison (M. C. Z.). Florida, Uhler (S. H. S.); and Jacksonville, Duval Co., Fla., Priddey (Bruner). Texas, Agassiz (M. C. Z.); Gulf Coast of Texas, Aaron (S. H. S.); Corpus Christi Bay, Palmer (S. H. S.); Waco, McLennan Co., Belfrage (S. H. S.); New Braunfels, Comal Co., Lincecum (S. H. S.); and Dallas, Boll (M. C. Z., S. H. S.), Texas. New Mexico, Meske (Bruner). Kansas (t. Bruner); Topeka, Shawnee Co., Shute (M. C. Z.); and West Point, Cuming Co. (Bruner), Nebr. Iowa City, Johnson Co., Shimek (Bruner), and Jefferson, Greene Co., and Dallas Co., Allen (S. H. S.), Iowa. Colorado, 5500' and 6500', Morrison (S. H. S.). Washington, Morrison (M. C. Z.). Hood River, Wasco Co., Portland, Multnomah Co., Drain and Roseburg, Douglas Co., Morse (Morse, S. H. S.), Oregon. Mt. Shasta district, Edwards (S. H. S.); Niles, Alameda Co., Woodworth (Morse); and Mendocino, Behrens (S. H. S.), California.

The form *fasciata* has been taken at Montreal, Ithaca, N. Y., Windham Co., Conn., and Virginia.

#### 10. *Scudderia septentrionalis*. Fig. 9.

*Phaneroptera septentrionalis* Serv., Orth., 416 (1839).

*Phaneroptera suturalis* Heer, Insektenf. Tert. Oen., II., 4 (1849).

*Phaneroptera curvicauda* Scudd. ! (pars) [nec De Geer], Bost. Journ. Nat. Hist., VII., 448 (1862).

*Scudderia angustifolia* Brunn. [nec Harr.], Mon. Phaneropt., 241 (1878).



*Scudderia angustifolia* Sauss.-Pict., Biol. Centr. Amer., Orth., 328, 329, 332 (1897).

*Scudderia truncata* Beut.!, Bull. Amer. Mus. Nat. Hist., VI., 252 (1894).

I think there can be little doubt that the *Phan. septentrionalis* of Serville is, as Brunner surmised, the species described by him under Harris' name *angustifolia*, and which has since been described by Beutenmüller as a new species under the name *truncata*. Serville's description will apply in most respects to the other species as well, but in three particulars it points to this: The small size, the length of the ovipositor of the female, and especially the lack of any mention of a pistillate anal segment in the male, while the subgenital plate is described with such particularity that had any process been present on the anal segment, it would surely have been mentioned in so formal a description; the case being quite different in Harris' popular description of his *angustifolia*. I am therefore constrained to restore Serville's name. The type does not exist in the Paris Museum, as I am kindly informed by Dr. Charles Brongniart, to whom I applied for particulars regarding it.

As regards Heer's *Phan. suturalis*, which has been completely overlooked, there can hardly be a doubt that it belongs here, for, after describing the subgenital plate, he goes on to say that the pistillate process of the anal segment seen in *curvicauda* is wanting ("an der Rückenplatte fehlt die vorn verbreitete zweilappige Verlängerung"), which is only true of the present species among the forms from the Eastern United States. His description, however, applies to a variety which may bear his name, *suturalis*, in which, as in some other of the species, the principal longitudinal veins of the tegmina carry a discolored stripe.

I must express a doubt whether the female described by Saussure and Pictet in the Biologia (from Panama?) belongs to this species; the measurements of the ovipositor indicate quite a distinct species. I add the measurements of a female from Massachusetts: Length of body, 20 mm. Pronotum, 5 mm. Tegmina, 26.5 mm. Middle breadth of same, 7.5 mm. Length hind femora, 18.5 mm. Ovipositor, 8.75 mm. Middle breadth of same, 2.5 mm.

Maine (t. Brunner); Norway, Oxford Co., Me., Smith (M. C. Z.). Mass. (S. H. S.); Wellesley, Norfolk Co. (Morse); and Seekonk, Bristol Co., Bridgham (M. C. Z.), Mass. Vineland, Cumberland Co., N. J. (Beutenmüller). Georgia (t. Heer). Chiriqui and Bugaba, Panama (t. Saussure and Pictet, — but see last paragraph, above).

11. *Scudderia forcipata*. Fig. 10.*Scudderia forcipata* Brunn., Mon. Phaneropt., 242 (1878).

“ “ Sauss.-Pict., Biol. Centr. Amer., 328, 329, 332-333,  
pl. 15, fig. 22, 23 (1897).

I have not seen this species, and copy the drawings in the Biologia. It was first recorded by Brunner from Mexico; and afterwards, more specifically, by Saussure and Pictet, from Cordova, Vera Cruz, and Tabasco. Only the male is known.

## SYMMETROPLEURA Brunner.

*Symmetropleura* Brunn., Mon. Phaneropt., 245 (1878).

*Symmetropleura* is distinctively characterized by having all the femora spined beneath, and by a very narrow fastigium between the antennæ; there is no pistillate production of the anal segment of the male. It was founded upon three species, found widely separated in North and South America and Africa. The single species in our fauna was known only by the male, the anal segment of which resembles that of *Scudderia septentrionalis*.

*Symmetropleura modesta*.*Symmetropleura modesta* Brunn., Mon. Phaneropt., 246 (1878).

Brunner's single specimen was a male and came from Carolina. I have a female from North Carolina. It differs in no respect from the brief description of the male, except that the whole pronotum is ferruginous. The ovipositor is rather short, abruptly upturned just beyond the base, the upturned portion feebly tapering, apically well rounded, the margins of the apical half distinctly crenulato-dentate. The following measurements may be given: Length of body, 20 mm. Pronotum, 3.75 mm. Tegmina, 25 mm. Middle breadth of same, 6 mm. Length of hind femora, 16.5 mm. Ovipositor, 5 mm. Middle breadth of same, 2 mm.

## PLATYLYRA (πλατύς, λύρα), gen. nov.

Fastigium of vertex anteriorly compressed, but apically almost as broad as the first antennal joint, truncate, contiguous with the frontal fastigium. Pronotum with the disk subconcave, broadening from in front backward, the front margin feebly concave, the hind margin a little convex, the lateral lobes subvertical, angularly deflexed, especially behind, where there are distinct canthi, the front margin straight and vertical, the posterior angle strongly and broadly rounded. Tegmina subovate,

the posterior margin beyond the anal area straight, the apex well rounded, the radial veins nearly straight, the first branch simple like the succeeding, and emitted far beyond the middle, all terminating near together near the lower outer angle of the tegmina; tympanum of male subovate, but little longer than broad, the sides strongly arcuate, crossed by a pair of strong veins; wings broad, no longer than the tegmina. All the femora unarmed beneath, the genicular lobe of hind femora with a pair of minute spines at apex. Mesosternum twice as broad as long, the lobes slight. Anal segment of male short, triangular, broader than long, with no appendix; subgenital plate of male of moderate length, depressed throughout, tapering, deeply and angularly emarginate at apex, and beyond the emargination fissate, the lobes thus formed feebly falcate at tip. Ovipositor a little longer than the pronotum, the lower margin strongly arcuate, the apex subacutangulate.

A single species is known, occurring on our Pacific coast.

*Platylyra californica*, sp. nov.

Green, the tympanum of the male tegmina testaceous, the canthi of pronotum posteriorly castaneous and the fore and middle legs more or less testaceous. Lateral lobes of pronotum broader than long, the lower anterior angle subrectangulate. Mesosternal lobes rather slight, rounded, erect or suberect; metasternal lobes small, bluntly triangular. Tegmina subcoriaceous, opaque, broadest in the middle of the basal two thirds, the tip well and equally rounded; wings of the same length as the tegmina, only the apical sixth of the humeral area subopaque. Legs very slender, but not very long; fore and middle tibiæ spined above on each margin. Anal segment of male broader than long, rounded triangular; cerci of male rather stout and cylindrical at base, but this portion only a little longer than broad, bearing a long, arcuate, and slightly tortuous, a little incurved, slightly compressed, pointed, corneous hook, at base half as broad as the base of the cerci; subgenital plate of male arcuate, rather long and broad, depressed, tapering in the basal half, but beyond subequal. Ovipositor slightly longer than the pronotum, rather broad, the upper margin arcuate at base but beyond straight, the lower margin strongly and subequally arcuate throughout, the apex subacutangulate, the margins apically rufous and rather delicately and briefly denticulate, the basal plica concolorous.

Length of body, ♂, 13 mm.; ♀, 15 mm. Pronotum, ♂, 4.5 mm.; ♀, 4 mm. Tegmina, ♂, ♀, 17.5 mm. Breadth of same in middle, ♂, ♀, 6 mm. Breadth of wings, ♂, 11 mm. Length of hind femora, ♂, 17

mm.; ♀, 16.5 mm. Ovipositor, 5 mm. Middle breadth of same, 2.3 mm.

2 ♂, 1 ♀. California; one from Mt. Wilson, 2400', Altadena, Los Angeles Co.; July 27, A. P. Morse; the others with no special locality.

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I am indebted to Messrs. Samuel Henshaw, A. P. Morse, and F. S. Sprague for the loan of much material, principally from New England; to Messrs. W. S. Blatchley of Indiana and William Beutenmüller of New York for the opportunity of examining the species described by them; to Prof. Lawrence Bruner of Nebraska for a set of the species known to him; and to Hofrath Brunner von Wattenwyl for replies to many inquiries. My friend Mr. Henshaw has further aided me in a variety of ways with the specimens in the Museum of Comparative Zoology and the Boston Society of Natural History.

In the course of this study I have examined more than 650 specimens of the genus *Scudderia* alone.

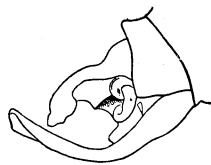
## EXPLANATION OF THE PLATE.

The drawings were made by Mr. J. W. Folsom, and, excepting the last, represent the lateral view of the extremity of the abdomen of the male, and a dorsal view of the anal segment, both enlarged.

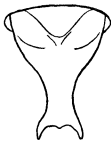
Fig. 1. *Scudderia texensis*.

- |       |   |   |
|-------|---|---|
| " 2.  | " | <i>pistillata</i> .   |
| " 3.  | " | <i>curvicauda</i> .   |
| " 4.  | " | <i>laticauda</i> .  |
| " 5.  | " | <i>mexicana</i> .   |
| " 6.  | " | <i>ungulata</i> .   |
| " 7.  | " | <i>furcifera</i> .  |
| " 8.  | " | <i>furcata</i> .  |
| " 9.  | " | <i>septentrionalis</i> .  |
| " 10. | " | <i>forcipata</i> . The end of the male abdomen from above;<br>and the subgenital plate from below. Copied from the<br><i>Biologia</i> . |

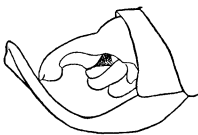
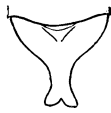
SCUDDER. — SPECIES OF SCUDDERIA.



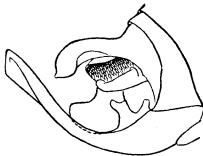
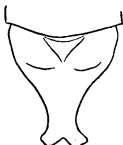
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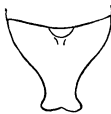
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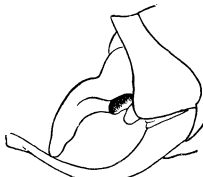
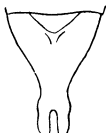
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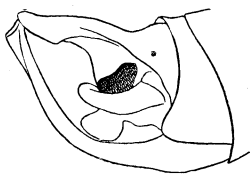
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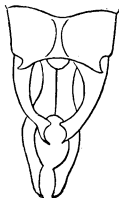
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